# **ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)**

February 2000

BUDGET ACTIVITY

# 7 - Operational System Development

PE NUMBER AND TITLE

**0603778A Multiple Launch Rocket System Product** Improvement Program

COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	25083	66595	59523	49475	4422	0	0	0	287640
D027 MLRS ILMS	1050	0	0	0	0	0	0	0	70025
D090 MLRS HIMARS	4815	36302	41835	30906	3933	0	0	0	117791
D093 MLRS Army Technical Architecture	3159	2145	0	0	0	0	0	0	5426
D784 Guided MLRS	16059	28148	17688	18569	489	0	0	0	94398

A. Mission Description and Justification: Expanding regional power threats require an evolutionary improvement program to maintain the effects of the Multiple Launch Rocket System (MLRS). This Product Improvement Program (PIP) provides for the Engineering and Manufacturing Development (EMD) of an Improved Launcher Mechanical System (ILMS), Guided MLRS Rocket (GMLRS), Joint Technical Architecture-Army (JTA-A) and High Mobility Artillery Rocket System (HIMARS). The ILMS, by decreasing the stow to aim point timeline, will increase responsiveness, improve survivability, and enhance effectiveness in countering surface to surface missile fire. HIMARS will allow MLRS capability to be C-130 transportable by mounting one rocket or missile pod on a 5-ton truck. It gives early entry forces immediate fire support within a hot landing zone without waiting for heavy-lift aircraft. The JTA-A will implement dual protocol capability and Force XXI Situational Awareness in M270A1 launchers and trainers. A multinational GMLRS program will greatly enhance the capability of the existing MLRS by providing greater range and significantly enhanced accuracy and interoperability among the nations signing the MLRS Memorandum of Understanding (MOU). The improvement in accuracy and range will reduce the number of rockets required to defeat targets, thus dramatically reducing the logistics burden, and will increase crew survivability.

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Exhibit R-2A (PE 0603778A)

# **ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)**

February 2000

**BUDGET ACTIVITY** 

# 7 - Operational System Development

PE NUMBER AND TITLE

0603778A Multiple Launch Rocket System Product Improvement Program

B. Program Change Summary	<u>FY 1999</u>	FY 2000	<u>FY 2001</u>
Previous President's Budget ( <u>FY 2000/2001 PB</u> )	25159	36540	58591
Appropriated Value	25244	67440	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-85		
b. SBIR / STTR	-195		
c. Omnibus or Other Above Threshold Reductions		-276	
d. Below Threshold Reprogramming	+149		
e. Rescissions		-569	
Adjustments to Budget Years Since FY 2000/2001 PB	-30		-4068
New Army Vision/Transformation Adjustment			+5000
Current Budget Submit ( <u>FY 2001</u> PB)	25083	66595	59523

Change Summary Explanation: Funding – FY 01: Project D090 was adjusted to reflect the New Army Transformation (+5000).

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Exhibit R-2 (PE 0603778A)

ARMY RDT&E BUDGET I	TEM JUS	TIFICA	TION (R-	2A Exh	ibit)		DATE <b>Fe</b>	bruary 20	000
BUDGET ACTIVITY 7 - Operational System Development		06	NUMBER AND 103778A I 1proveme	Multiple I		locket Sy	stem Pro		PROJECT <b>D027</b>
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D027 MLRS ILMS	1050	(	0	0	0	0	0	0	70025

A. <u>Mission Description and Justification:</u> The MLRS Improved Launcher Mechanical System (ILMS) project provides for the Engineering and Manufacturing Development (EMD) of the ILMS. The ILMS decreases the stow to aim point timeline, enhances effectiveness in engaging and supporting the force, and increases MLRS platform survivability. The ILMS replaces selected hydraulic and mechanical components of the MLRS M270 launcher mechanical drive system. The time required for movement of the Launcher Loader Module from the stowed position to first rocket away is reduced from 93 seconds to 16 seconds. Reload operations for twelve rockets are reduced from 260 seconds to 160 seconds. These improvements allow faster engagement of short dwell time targets and increase crew survivability on the firing point and reload area. Reduced operation and support costs are expected with this design. When combined with the Improved Fire Control System (IFCS), the launcher is designated as M270A1.

# FY 1999 Accomplishments:

1050 System Integration

Total 1050

FY 2000 Accomplishments: Project not funded in FY 2000

FY 2001 Accomplishments: Project not funded in FY 2001

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To	Total
								Complete	<u>Cost</u>
Missile Procurement, Army									
Budget Activity 2:									
MLRS Launcher (C65900)	121134	137507	188689	203700	175884	160262	160087	Continuing	4025393
Budget Activity 4:									
MLRS Initial Spares (CA0257)	4792	6196	6456	12249	13059	13541	9276	Continuing	296329

Project D027 Page 3 of 13 Pages Exhibit R-2A (PE 0603778A)

# DATE **ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)** February 2000 BUDGET ACTIVITY PE NUMBER AND TITLE **PROJECT** 7 - Operational System Development 0603778A Multiple Launch Rocket System Product D027 **Improvement Program** C. Acquisition Strategy: The MLRS ILMS is an ACAT III program with an EMD phase ending 2QTR FY00 and fielding beginning in 4QTR FY01. A sole source contract for EMD was awarded to Lockheed Martin Missile & Fire Control System (LMMFCS) in August 1995. Originally planned to be completed in FY 98, this program was extended to 2QTR FY00 due to schedule impacts resulting from IFCS program delays. D. Schedule Profile FY 2001 FY 2002 FY 2003 FY 2004 FY 1999 FY 2000 FY 2005 M270A1 IOT&E (Low Risk Proposed Plan) 2QTR Page 4 of 13 Pages Exhibit R-2A (PE 0603778A) Project D027

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ARMY RDT&E BUDGET IT	- · · · · · · · · · · · · · · · · · ·									
7 - Operational System Development		0	_	Multiple l		ocket Sy	stem Pro		PROJECT D090	
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate		FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
D090 MLRS HIMARS	4815	363	41835	30906	3933	0	0	0	117791	

A. <u>Mission Description and Justification:</u> The High Mobility Artillery Rocket System (HIMARS) provides for the maturation phase of the HIMARS launcher. HIMARS will be a C-130 transportable, wheeled version of the MLRS launcher and will be capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The HIMARS will provide tactical and operational fires during both offensive and defensive operations. The HIMARS will consist of the MLRS Improved Fire Control System (IFCS), a wheeled carrier, an on-board reload capability, and a Launcher Loader Module (LLM) portion that will perform all operations necessary to complete a fire mission. The HIMARS will be deployable worldwide and will operate in a wide range of climatic conditions. HIMARS units will functionally/operationally mirror current MLRS units and will be assigned to Corps field artillery brigades in support of light, airborne, air assault Divisions and forced/early entry contingency force operations.

# **FY 1999 Accomplishments:**

- 2364 Risk Reduction Tasks including Reloader/Hydraulic Robustness/Reliability Efforts
- 1000 OGA Support
- 541 Technical Assessments/Evaluations, Simulation Support
- 295 Development Testing
- 335 Maturation Preparation: Milestone Documentation
- 280 Minor Tasks Including In-House

Total 4815

# FY 2000 Planned Program:

- 25310 System Design
- 3556 Government Furnished Equipment (GFE), Communication & Trucks
- 1899 OGA Support
- 1632 Maturation Preparation: Milestone Documentation, Technical Assessments
- 1580 Development Testing
- 1348 Minor Tasks Including In-House
- 977 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 36302

Project D090 Page 5 of 13 Pages Exhibit R-2A (PE 0603778A)

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit) BUDGET ACTIVITY 7 - Operational System Development Improvement Program PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program

# **FY 2001 Planned Program:**

- 29477 System Design, Test & Integration and Technical Assessments
- 836 GFE, Communication & Trucks
- 2885 Development Testing (6 Test Articles)
- 1438 Technical Assessments and Milestone Documentation
- 1056 OGA Support
- 1143 Minor Tasks Including In-House
- 5000 Funds will be used to accelerate HIMARS development in support of the New Army Transformation (Sys Design, Test and Intg. Tech Assessments)

Total 41835

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	<u>To</u>	Total
								<u>Complete</u>	<u>Cost</u>
Missile Procurement, Army									
Budget Activity 2:									
HIMARS Launcher (C03000)	0	0	0	0	130138	115523	164264	Continuing	1189567
Budget Activity 4:									
Initial Spares, HIMARS (CA0288)	0	0	0	0	0	7657	3634	Continuing	68145

**C.** <u>Acquisition Strategy:</u> HIMARS designated an ACAT II program with the Maturation phase beginning in FY00. The First Unit Equipped (FUE) is planned for FY05. The contracting strategy will be sole source.

D. Schedule Profile	<u>FY1998</u>	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Risk Reduction Contract Award		2QTR						
Maturation IPR, Maturation Contract Award			1QTR					
(36 Months)								
Critical Design Review (CDR)				1QTR				
6 Launchers, Integrated Developmental					1QTR			
Test/Operational Test (DT/OT)								
LRIP IPR						1QTR		

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### DATE **ARMY RDT&E COST ANALYSIS (R-3)** February 2000 BUDGET ACTIVITY PE NUMBER AND TITLE **PROJECT** 0603778A Multiple Launch Rocket System Product 7 - Operational System Development D090 **Improvement Program** I. Product Development Contract Performing Activity & Total FY 1999 FY 1999 FY 2000 FY 2000 FY 2001 FY 2001 Cost To Total Target Method & Location PYs Cost Cost Award Cost Award Cost Award Complete Cost Value of Type Date Date Date Contract 3<sup>rd</sup> QTR 1st OTR Risk Reduction/ SS/CPIF & \*LMMFCS 2364 26287 1st OTR 34477 17580 80708 **CPAF Maturation Contract** ΤX 4<sup>th</sup> QTR N/A TACOM (S&S) 1000 1899 As Req. 1056 As Rea. 563 4518 Cab Improv./ OGA GFE,Comm,Trks & Trls SS/CPFF \* S&S SEALY TX 3556 2nd OTR 836 1st OTR 1190 5582 Government Support RDEC\*, IMMC\*, RSA 541 1288 3707 6968 N/A As req. 1432 As Req. As Req. Subtotal Product 3905 33174 37657 23040 97776 Development: Remarks: \*RDEC - Missile Research, Development and Engineering Center \*IMMC - Integrated Materiel Management Center \*RSA - Redstone Arsenal, AL II. Support Costs FY 1999 FY 1999 FY 2000 FY 2001 FY 2001 Contract Performing Activity & Total FY 2000 Cost To Total Target Method & Location PYs Cost Award Award Award Cost Cost Cost Complete Cost Value of Date Contract Type Date Date Support Contract C & CPFF Madison Research 335 200 10TR 150 1st OTR 250 935 3rd qtr Hsv AL **Subtotal Support Costs:** 335 200 150 250 935 III. Test and Evaluation Contract Performing Activity & Total FY 1999 FY 1999 FY 2000 FY 2000 FY 2001 FY 2001 Cost To Total Target Method & Location PYs Cost Cost Award Cost Award Cost Award Complete Cost Value of Date Date Contract Type Date 2<sup>nd</sup> OTR APG MD\*, WSMR 295 As Req. Test Support 1580 As Req. 2885 10082 14842 NM\* & RTTC RSA\* Subtotal Test and Evaluation: 295 1580 2885 10082 14842 Remark: \*APG MD - Aberdeen Proving Ground, Maryland \*WSMR NM – White Sands Missile Range, New Mexico \*RTTC RSA – Redstone Technical Test Center, Redstone Arsenal, AL \*LMMFCS - Lockheed Martin Missile & Fire Control Systems \*S & S – Stewart & Stevenson

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Exhibit R-3 (PE 0603778A)

Project D090

	Al	RMY RDT&E CO	OST AN	ANALYSIS (R-3)							uary 200	000	
BUDGET ACTIVITY 7 - Operational Syst	em Develo	opment		06	UMBER AND 03778A proveme	Multiple		h Rocke	et Syste	m Produ	PR	O90	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
a. In-House Support Subtotal Mgmt Services:	N/A	MLRS Proj Ofc , RSA		280 280	QTRLY	1348 1348	QTRLY	1143 1143	QTRLY	1467 1467	4238 4238		
Project Total Cost:				4815		36302		41835		34839	117791		

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# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit) BUDGET ACTIVITY PE NUMBER AND TITLE

# 7 - Operational System Development

PE NUMBER AND TITLE PROJECT

0603778A Multiple Launch Rocket System Product

D093

Improvement Program

February 2000

COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D093 MLRS Army Technical Architecture	3159	2145	0	0	0	0	0	0	5426

**A.** <u>Mission Description and Justification</u>: The MLRS Joint Technical Architecture - Army (JTA-A) will integrate the Force XXI/JTA-A mandated 188-220 protocol and convert existing MLRS fire support messages to Joint Variable Message Format (JVMF) for M270A1 launchers. The JTA-A hardware and software development effort will provide Force XXI, First Digitized Division, message processing capability for M270A1 launchers.

# **FY 1999 Accomplishments:**

- 2813 Develop VMF and Dual Protocol Logic Software
- 106 Development Testing
- 240 Minor Tasks Including In-House

Total 3159

# FY 2000 Planned Program:

- 1467 Develop Engineering Design Test (EDT) Units
- 365 Development Testing
- 256 Minor Tasks Including In-House
- Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 2145

# FY 2001 Planned Program: Project not funded in FY 2001

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	<u>To</u>	Total
								<u>Complete</u>	<u>Cost</u>
Missile Procurement, Army									
Budget Activity 2:									
MLRS Launcher (C65900)	121134	137507	188689	203700	175884	160262	160087	Continuing	4025393
Budget Activity 3:									
MLRS Mods(C67500)	2767	6596	16499	24297	25178	23417	17430	Continuing	534707

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### DATE **ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)** February 2000 BUDGET ACTIVITY PE NUMBER AND TITLE PROJECT 7 - Operational System Development 0603778A Multiple Launch Rocket System Product D093 **Improvement Program** FY 2002 FY 2003 **B.** Other Program Funding Summary FY 1999 FY 2004 To FY 2000 FY 2001 FY 2005 Total Complete Cost Budget Activity 4: MLRS Initial Spares (CA0257) 4792 6196 6456 12249 13059 13541 9276 Continuing 296329 MLRS Mod Spares (CA0265) 477 838 856 77312 27 5717 1364 5973 Continuing C. Acquisition Strategy: The JTA-A standards will be implemented for the M270A1 launcher to provide the Force XXI capabilities for the First Digitized Division. FY1998 FY2002 FY2003 FY2004 FY2005 D. Schedule Profile FY1999 FY2000 FY2001 Industry Search, Cost/ Performance Trades 2QTR Prototype Hardware, Sys Integration & Test 3QTR Production Decision, Procurement Award 3QTR Initial M270A1 fielding 4OTR

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### DATE **ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)** February 2000 BUDGET ACTIVITY PE NUMBER AND TITLE **PROJECT** 7 - Operational System Development 0603778A Multiple Launch Rocket System Product D093 **Improvement Program** A. <u>Mission Description and Justification:</u> The Guided Multiple Launch Rocket System (GMLRS) project provides for US participation in a Multinational Engineering and Manufacturing Development (EMD) of a guided rocket that will greatly enhance the capability of the existing MLRS by providing greater range and significantly enhanced accuracy. Since fewer rockets are required to defeat a target, the logistics burden also will be reduced. The GMLRS will result in reduced mission times and increased survivability of the system. **FY 1999 Accomplishments:** Assembly of Components, Components Lab Testing and Static Tests 14734 **Development Testing** 987 Minor Tasks Including In-House 16059 Total **FY 2000 Planned Program:** 25204 EDT Flight Tests, Production Qualification Testing (PQT) Ground Tests, Hardware Assembly and Integration 120 Technical Assessments/Evaluations and Simulation Support Development Testing (3 Test Articles) 1459 607 Minor Tasks Including In-House 758 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR) 28148 Total FY 2001 Planned Program: 10866 PQT Ground and Flight Tests, Hardware Assembly and Prove-out, Test Results Analysis Preparation of LRIP IPR Documentation 5536 Development Testing (85 Test Articles) Minor Task Including In-House 1036 17688 Total FY 2000 FY 2001 FY 2002 FY 2003 FY2004 FY2005 **Total Cost** FY1999 Cost to COST (In Thousands) **Estimate** Estimate Estimate Estimate Estimate Estimate Complete Actual D784 Guided MLRS 16059 28148 17688 18569 489 94398

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Project D093

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ARMY RDT&E BUD	GET ITE	M JUST	IFICAT	ION (R-	2A Exh	ibit)		DATE <b>Feb</b> i	ruary 2000
BUDGET ACTIVITY 7 - Operational System Development	Development 0603778A Multiple Launch Rocket System Product Improvement Program								
B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total <u>Cost</u>
Missile Procurement, Army Budget Activity 2:	111///	11 2000	<u>F1 2001</u>	112002	112003	112004	112005	complete	COSL
ER-MLRS (C65402)	0	3747	9413	40425	71419	80911	80823	Continuing	3490859

C. Acquisition Strategy: The GMLRS acquisition strategy is a streamlined product improvement program which permits entering Low Rate Initial Production (LRIP) and subsequent Full-Scale Production, after completion of a 48-month EMD program. The primary objective of the EMD phase is to develop a rocket with greater range and significantly enhanced accuracy with minimum impact on existing MLRS companion hardware and software. This effort will incorporate the results of other development efforts for a modified submunition and a new rocket motor for increased range. The acquisition alternative most advantageous to the government is a sole source EMD contract to the system prime contractor, Lockheed Martin Missile & Fire Control Systems (LMMFCS), with maximum competition of non-developmental item (NDI) components at the vendor level.

D. Schedule Profile	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Advanced Technology Development Flt Test, MS II,	2-4QTR							
EMD Contract, Sys Design								
System Design, PDR		1- 4 QTR						
EDT Grd & Flt Test, CDR			1-4QTR					
PQT Grd Test, Facilitization IPR, PQT Flt Test, Interim				1-4QTR				
Product Definition Data Package, LRIP IPR								
LRIP I Option, Gov Functional Configuration Audit					1-4QTR			
(FCA), Final PDDP								
LRIP II Option, Production Validation Test (PVT) Grd						1-3QTR		
& Flt Test,1 <sup>st</sup> LRIP Rkt Del, Initial Operational Test								
(IOT) Grd & Flt Test								
MS III, FRP Contract, Initial Operational Capability							1-4QTR	
(IOC)								

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE  0603778A Multiple Launch Rocket Sy Improvement Program					PROJECT			
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Targe Value o Contrac	
<ul><li>a. EMD Contract</li><li>b. Government Support</li></ul>	SS & CPAF N/A	LMMFCS Dallas, TX RDEC*, IMMC*, RSA*	9168 2543	12759 1975	QTRLY QTRLY	22429 2775	QTRLY QTRLY	7830 3036	QTRLY QTRLY	8975 2559	61161 12888		
Subtotal Product Development:			11711	14734		25204		10866		11534	74049		
Remarks: *RDEC – Missile Res *IMMC – Integrated N *RSA – Redstone Arso	Aateriel Manage	ment Center	ter										
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Targe Value o Contrac	
a. Support Contract	C & CPFF	Madison Research, Hsv, AL	672			120	1 <sup>st</sup> QTR	250	1 <sup>st</sup> QTR	768	1810		
Subtotal Support Costs:			672			120		250		768	1810		
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Targe Value o	
a. Test Support Subtotal Test and Evaluation:	N/A	WSMR NM & TBD	256 256	338 338	As Req	1459 1459	As Req	5536 5536	As Req	5744 5744	13333 13333		
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Targe Value o	
a. In-House Support Subtotal Mgmt Services:	N/A	MLRS Proj Ofc, RSA	806 806	987 987	QTRLY	1365 1365	QTRLY	1036 1036		1012 1012	5206 5206		
Project Total Cost:			13445	16059		28148		17688	75340	19058	94398		
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